
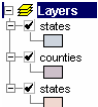


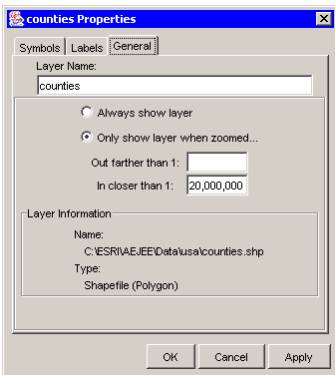
Getting Started with ArcExplorer—Java Edition for Education – Lesson 5

This lesson covers the following ideas, tools, and capacities:

- Scale dependency
- Accessing data from ArcIMS servers

NOTE: In order to do this lesson successfully, you must be connected live to the Internet, because the lesson will use data from the Geography Network.

1.  Start AEJEE. This lesson will build a project from scratch, so there is no project to open.
2.  Start building the project from scratch by adding in two layers from the data folder **/ESRI/AEJEE/DATA/USA**. Add the layers "**counties.shp**" and "**states.shp**". Move the "**states**" layer to the bottom of the TOC. Add the "**states.shp**" layer again, so that there is one "**counties**" layer sandwiched between two "**states**" layers.
3. Save your new project. Choose the menu item "**File/Save**", and navigate to where AEJEE data and projects are stored. Label this as "**XYZ_us_gnhd.axl**", but replace "XYZ" with your initials.
4. Set the top "**states**" symbol to be an empty box (**Style: "Transparent fill"**) with a black outline of width "**2**". Click "**OK**". Back in the map, the states have become almost invisible because the counties are too numerous.
5. We can set the counties to appear only when it makes sense for them to show, using "scale dependency". Zoom in so the states of TX, OK, and NM pretty much fill your map space. Note the scale shown in the status bar. This is roughly the scale at which we want county outlines to turn on. (Using a small map space, no wider than the toolbar, this might be about 1:20,000,000; if your map occupies a lot of screen space, a different scale might work better for you.)

6.  Right-click the "**counties**" layer and choose "**Properties**". Under the "**General**" tab, click the button for "**Only show layer when zoomed...**" and, in the box for "**In closer than 1:**", type "20,000,000" (or another nice round number). Click "**OK**".

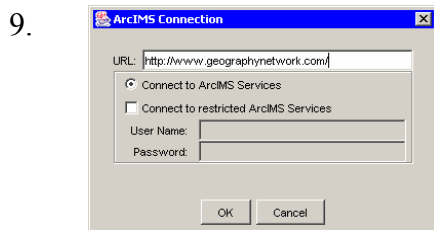
7. Click the "**Zoom to Full Extent**" button ... and the counties disappear! Zoom in little bit at a time, approaching the 1:20,000,000 scale, and then past that mark, to see the effect.

NOTE: Scale dependency is a powerful capacity to use when you have data sets of different resolution. GIS data providers who distribute data live online often rely on this.



Now it's time to add some more data ... from the Internet! Click the "**Add Data...**" button. In the "**Content Chooser**" window's "**Look In:**" box, choose "**Internet Servers**".

NOTE: Serving data live over the Internet is a powerful capacity. Data can be updated at any time. Viewers can often rely on experts preparing appropriate packages in appropriate presentations. The Geography Network is one such framework, presenting a large storehouse of data, much of it available to be used for free. It helps to understand more about the GN, and a good set of lessons is available from the ArcLessons archive, www.esri.com/arclessons. (Do a keyword search for "Geography Network".)

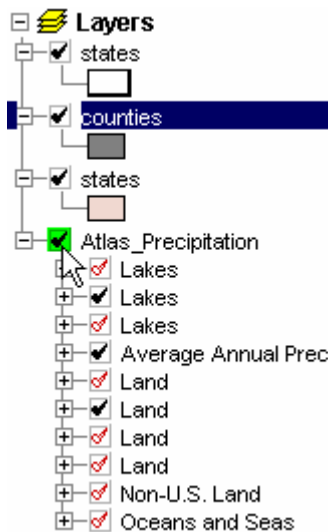


Double-click the "**Add Internet Server**" icon. The "**ArcIMS Connection**" window appears, with a default pointing to the Geography Network. Click "**OK**".



A large, scrollable list of data sources will appear. Scroll through the list and look at the choices. Some of the names may be a little hard to distinguish right away, so we'll work with some specific choices. Look for "**Atlas_Precipitation**", click it, and click "**OK**". After a few seconds, a new window appears, with an "image data" icon and "**Atlas_Precipitation**". Click it, and click "**OK**".

11.

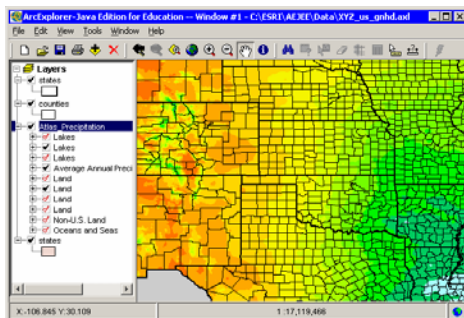


The new layer comes in at the bottom of the TOC. The checkbox next to the name begins pulsing green, indicating it is pulling data across the Internet. While it is preparing to draw, notice that all data sets come in with their legend "collapsed", and that some have a black check mark while others have an outlined red check mark. GN data sets often use scale dependency. The black-checked layers are set to display at this scale, while the layers with an outlined red check are on but not at the right scale for display. This is why you may see layers with similar names right next to each other, such as "**Land**" here; the four layers have a different resolution and are set to display at appropriate scale.

12.

Problem: Your "**counties**" layer and your bottom "**states**" layers are both opaque, and covering the data you have added. Right-click on the bottom "**states**" layer and send it to the bottom of the TOC. Change the symbology of the "**counties**" layer to be "**Transparent fill**" (like you did with the top "**states**" layer) with black border of width "**1**", and click "**OK**".

13.

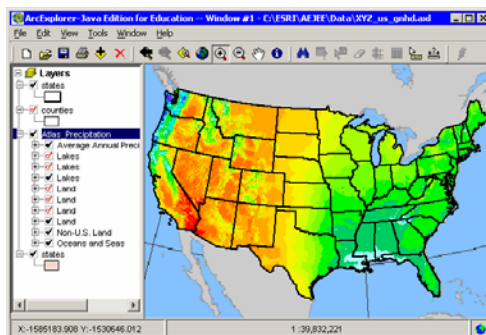


Fabulous! You have a great map, with important reference data from your hard drive integrating with valuable data from the Internet! You can spill open the legend next to "Average Annual Precipitation" and see what the colors mean. Zoom out to see the 50 states (notice that not all data sets cover all areas equally), and save your project.

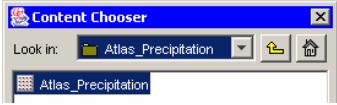
14.

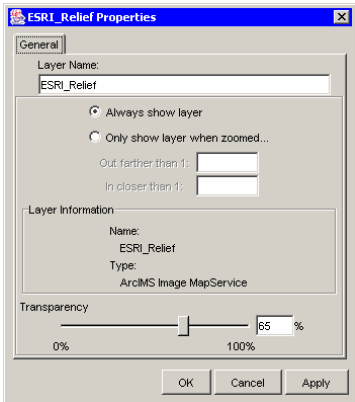
There's one last tweak to make for this project. It would help if the map were projected, instead of being "decimal degree". The data coming from the GN is special – it can be projected on the fly, back at its source. (Not all data coming over the Internet can be projected, and you can't tell which until you try.)

15.



Choose "**Tools/Projection**". Under "**Systems**", choose "**Regional Projections**", then "**Albers Equal Area**", and "**United States**". Click "**OK**". Note that your base layer of states draws immediately to show where you are. Without waiting for the rest to appear, zoom in around the 48 conterminous states. When the rest of the data appear, notice that everything has projected into the proper display. Save your map!

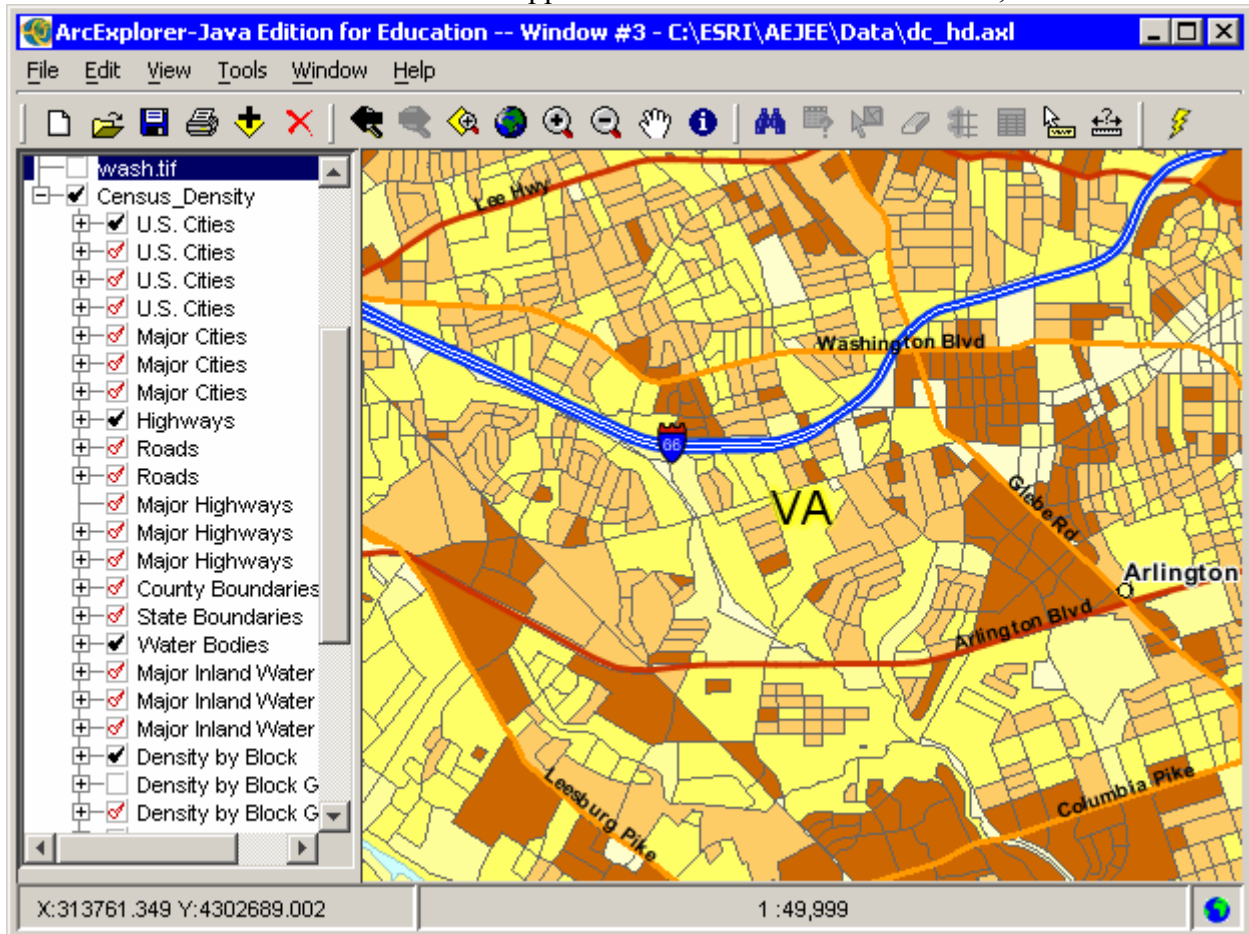
16.  Now we need a world project. Choose "**Window/New Window**". Start by adding some data from the Geography Network. Click the "**Add Data...**" button. Since you were last inside the "**Atlas_Precipitation**" folder, you need to click the "**up**" arrow to get back to the main choices. Find "**ESRI_Relief**", click it and click "**OK**". Once again, you're presented with just one icon for "image data" and the name "**ESRI_Relief**". Click it and click "**OK**".
17. When the new map appears, choose to save your project. Navigate to **/ESRI/AEJEE/DATA** and save the project as "**XYZ_world_gn.axl**", replacing 'XYZ' with your initials.
18. The new map is pretty, but lacks references. AEJEE only carries a little bit of world data with it, so we'll add more rich data from the Geography Network. Click "**Add Data...**" again, and navigate up one level to find and add "**ESRI_World**".
19. The new data comes in at the bottom of the TOC with a huge volume of layers, most of which are turned off when zoomed all the way out. But the real problem is that the "Relief" layer is on top and opaque. Turning it off allows seeing the layer underneath, but removes the nice view of landforms. What we really need to do is make the top layer "see-through".

20.  Right-click "**ESRI_Relief**" and open up the **Properties**. Notice that the window offers much less control than is available for a data set coming from the hard drive. (This is true even for a "rich" data layer like "**ESRI_World**".) All you can do here is set a scale dependency and "**Transparency**". Set the slider bar to about 65% and click "**OK**". Try several different levels of transparency and zoom levels to see what works best for your map. (Notice as you zoom and pan that the map will draw quickly what it can, using whatever is in the computer memory, then pauses for a few seconds as it retrieves more data. Wait for the "pulsing green boxes" to indicate the data have all been retrieved.) When you're finished, zoom to full extent and save the project.
21. The last test is to see if these maps can reproject without any other data sets in the view. From the menu bar of your world map, choose "**Tools/Projection**". Spill open "**World Projections**", then "**World Projections (Sphere)**". Choose "**Eckert IV**", and click "**OK**". The command will go back to the server to prepare the data for AEJEE in a projected format and send it back for display ... perfectly! (Remember, not all server data will re-project this way. You'll just have to try layers and see.)

22. **REVIEW:** In this lesson, we have covered the following ideas, tools, and capacities:
- Scale dependency
 - Accessing data from ArcIMS servers
23. **SELF CHECK:** Now it's time to see if you can use these concepts and skills on a different set of data.
24. Create a new window and open the project "**dc_hd.axl**". From the Geography Network, add the data set "**Census_Density**" (population density at varying scales, from the 2000 Census), and set this as the bottommost layer. Alter the projection so that all layers work together. (Remember that the DC image is "UTM 1983 Zone 18".) When zoomed to the layer "**wash.tif**", which data set is visible – Density by State, County, Tract, Place, Block Group, or Block? At what scale does "**Density by Block**" appear?
25. Create a new window and add from the Geography Network a data set that you have not yet used. Write a brief synopsis of what is included in that data set.

FOR THE TEACHER:

- 24-A Remember that the "**wash.tif**" image is stored in "**UTM 1983 Zone 18**", and that the view must be projected into this for the image to work with the other files. The scale of data that appears when zoomed to the layer "**wash.tif**" will depend on how large the map space is; a large map space will yield a larger scale map, and population data at finer resolution, while a small map space will yield a smaller map scale and population data at coarser resolution. Block data appear when zoomed closer than 1:50,000.



- 25-A Answers here will vary according to the data explored. Good layers to investigate abound!